



R. Michael Glover
H. B. Robinson Steam
Electric Plant Unit 2
Site Vice President

Duke Energy Progress
3581 West Entrance Road
Hartsville, SC 29550

O: 843 857 1704
F: 843 857 1319

Mike.Glover@duke-energy.com

10 CFR 50.73

Serial: RNP-RA/15-0033

MAY 15 2015
United States Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261/RENEWED LICENSE NO. DPR-23

LICENSEE EVENT REPORT NO. 2015-002-00:
PRESSURIZER POWER OPERATED RELIEF VALVE (PORV) LIMIT SWITCHES' QUALIFIED
LIFE EXCEEDED DUE TO MISCALCULATION

Ladies and Gentlemen:

Pursuant to 10 CFR 50.73, Duke Energy Progress, Inc. is submitting the attached Licensee Event Report. Corrective actions are scheduled to be completed during Refueling Outage 29 and will restore full compliance with NRC regulations. Should you have any questions regarding this matter, please contact Mr. R. Hightower, Manager – Nuclear Regulatory Affairs at (843) 857-1329.

This document contains no new Regulatory Commitments.

Sincerely,

R. Michael Glover
Site Vice President

RMG/jmw

Attachment

c: V. McCree, NRC, Region II
NRC Resident Inspector, HBRSEP
M. Barillas, NRR

JE22
MRR

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
PRESSURIZER POWER OPERATED RELIEF VALVE (PORV) LIMIT SWITCHES'
QUALIFIED LIFE EXCEEDED DUE TO MISCALCULATION



LICENSEE EVENT REPORT (LER)

(See Page 2 for required number of digits/characters for each block)

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. FACILITY NAME H. B. Robinson Steam Electric Plant, Unit No. 2		2. DOCKET NUMBER 05000 261	3. PAGE 1 OF 3
--	--	---	--------------------------

4. TITLE
Pressurizer Power Operated Relief Valve (PORV) Limit Switches' Qualified Life Exceeded Due to Miscalculation

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
03	18	2015	2015	002	00	05	18	2015	FACILITY NAME	DOCKET NUMBER
										05000
										05000

9. OPERATING MODE		11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)							
1	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)					
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)					
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)					
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)					
100	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)					
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)					
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)					
	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER					
	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A					

12. LICENSEE CONTACT FOR THIS LER

LICENSEE CONTACT W. R. Hightower - Manager, Nuclear Regulatory Affairs	TELEPHONE NUMBER (Include Area Code) (843) 857-1329
---	--

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

14. SUPPLEMENTAL REPORT EXPECTED <input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

At 1703 hours EST on 03/18/2015 with H. B. Robinson Steam Electric Plant, Unit No. 2 in Mode 1 at 100 percent power, it was determined that the limit switches that provide indication in the control room as to the position of the pressurizer power operated relief valves (PORVs) may be at the end of their service life. Further investigation revealed that the qualified life requirements of 10 CFR 50.49 and Regulatory Guide 1.97, Criteria for Accident Monitoring Instrumentation for Nuclear Power Plants, for the limit switches was incorrect in station environmental qualification documentation.

The normal operation of the PORV limit switches in non-accident conditions is not limited, and they are considered operable in all modes of operation except during a design basis accident. However, the limit switches are considered inoperable for the purposes of meeting Technical Specification (TS) 3.3.3, Post Accident Monitoring Instrumentation. Therefore, this circumstance is reportable as a condition prohibited by TS under 10 CFR 50.73(a)(2)(i)(B).

Standing Instruction 15-005, effective on March 20, 2015, outlines the alternate method for continuous and post-accident monitoring of pressurizer PORV position until the limit switches are returned to service. Work orders have been generated to replace the limit switches during the upcoming refueling outage, currently scheduled to begin on May 12, 2015.



**LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET**

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
H. B. Robinson Steam Electric Plant, Unit No. 2	05000 261	YEAR	SEQUENTIAL NUMBER	REV NO.	2 OF 3
		2015	- 002	- 00	

NARRATIVE

PLANT IDENTIFICATION

Westinghouse Pressurized Water Reactor

BACKGROUND

Title 10 of the Code of Federal Regulations (CFR) Section 50.49, Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants, and Regulatory Guide (RG) 1.97, Criteria for Accident Monitoring Instrumentation for Nuclear Power Plants, form the regulatory basis for electric equipment qualification requirements at H. B. Robinson Steam Electric Plant, Unit No. 2 (HBRSEP2). Among these requirements is that which provides for post-accident monitoring of certain variables considered important to post-accident assessment. To this end, Technical Specifications (TS) 3.3.3, Post Accident Monitoring (PAM) Instrumentation, requires that PAM instrumentation [IP] for each Function in Table 3.3.3-1 be operable in Modes 1, 2, and 3. Table 3.3.3-1, Function 22, requires an inoperable power operated relief valve (PORV) [RV] Position (Primary) channel [CHA] to be restored to OPERABLE status within 7 days. If this indication is not restored within 7 days, a report in accordance with TS 5.6.6 is required within the following 14 days. This report was submitted to the Nuclear Regulatory Commission (NRC) on April 1, 2015 (Serial: RNP-RA/15-0026). The Qualified Life requirements for the pressurizer PORV limit switches [33] specified in Equipment Qualification Data Package (EQDP) – 2200 was exceeded and rendered them inoperable with respect to their monitoring function during and following a design basis accident (DBA). The regulatory impact to the station as a consequence of this exceedance requires a 60-day licensee event report (LER) to the NRC under 10 CFR 50.73(a)(2)(i)(B), "Operation or Condition Prohibited by Technical Specifications."

EVENT DESCRIPTION

On 3/18/2015, with the plant operating at 100% power and no involvement of out-of-service structures, systems or components, it was determined that the Qualified Life required by 10 CFR 50.49 and RG 1.97 for the pressurizer PORV NAMCO limit switches (PCV-455C-LS-C & O and PCV-456-LS-C & O) was incorrect in EQDP-2200, Revision 10, the design basis document that demonstrates that a component is qualified to perform its intended design function during a design basis accident. The NAMCO limit switches are used in PAM instrumentation to provide indication to control room operators as to the position of the pressurizer PORVs during a DBA, which is a requirement of TS 3.3.3. The calculations that formed the basis for the Qualified Life of the limit switches were incorrectly performed. Revised draft and verified equipment qualification (EQ) Qualified Life calculations for EQDP-2200, Revision 11, were completed on March 19, 2015 and utilized more recent temperature data from the plant computer [CPU], which more accurately depicts the temperature of the environment where the switches are located than was previously considered in the EQDP. The corrected calculations revealed a significant reduction in the Qualified Life of the NAMCO limit switches, and that they are not currently qualified for their monitoring function during and following a DBA. However, based on engineering evaluation the pressurizer PORV limit switches are considered operable in all other modes of plant operation. Nonetheless, these limit switches are scheduled to be replaced during refueling outage (RO)29, which began on May 12, 2015.

CAUSAL FACTORS

The calculation performed in EQDP-2200 was an approved part of the EQ procedure, EGR-NGGC-0156, Environmental Qualification of Electrical Equipment. The direct cause of the miscalculated qualified life for the NAMCO limit switches was that the results of the calculation were not adequately checked by utility engineering personnel that performed the calculation or the person performing the design verification. Contact with the individual that performed the calculation is not possible. The incorrect calculation was discovered during the EQDP revision process for Engineering Change 80767, and a review of historical revisions to EQDP-2200 showed this miscalculation to be a historical latent error that was not identified in subsequent revisions to the document.

**LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET**

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
H. B. Robinson Steam Electric Plant, Unit No. 2	05000 261	YEAR	SEQUENTIAL NUMBER	REV NO.	3 OF 3
		2015	- 002	- 00	

NARRATIVE

CORRECTIVE ACTIONS

Corrective actions taken to restore compliance with regulations and examine the extent of this condition are listed below.

Immediate:

1. Condition Report (CR) 738953 was generated on March 18, 2015 to document the issue.
2. Standing Instruction 15-005, effective March 20, 2015 for pressurizer PORV limit switches, outlines the alternate method of monitoring pressurizer PORV position until the limit switches are returned to service.

Completed:

1. Subsequent to the discovery of the condition, the errant calculation was corrected and verified by two EQ engineers.
2. EQDP-2200 was revised (Revision 11).
3. Work Orders (WOs) were reviewed to determine the installation date of the NAMCO limit switches and associated equipment.

Planned:

1. Replacement of pressurizer PORV NAMCO limit switches PCV-455C and PCV-456 and associated components that were qualified via EQDP-2200 during RO29. (WOs 2047219-01, 2047223-01)

Extent-of-Condition:

An extent-of-condition evaluation was performed and it was determined that this condition was limited to EQDP-2200, and all limit switches that are qualified via this EQDP were reviewed. WOs were written to replace any limit switches that were found to be approaching or past the end of their Qualified Life.

SAFETY ANALYSIS

The failure modes associated with the pressurizer PORV limit switches is limited to the monitoring function during and following a DBA. Normal operation of these switches in non-accident conditions is not limited. This condition does not impact the operability of the pressurizer PORVs as defined by TS 3.4.11 and 3.4.12, since the limit switches do not prevent the pressurizer PORVs from minimizing challenges to the pressurizer safety valves [RV] or actuating to protect the plant from a low temperature over pressure (LTOP) event. The RG 1.97 PAM indication that may be lost is a Type D/CAT 2 indication, "Closed-Not Closed," on PCV-455C and PCV-456, primary PORV position. However, alternate methods for post-accident monitoring of pressurizer PORV position are outlined in Standing Instruction 15-005. The instruction outlines the alternate methods for both continuous and post-accident monitoring of pressurizer PORV position, which is effected via pressurizer level, pressurizer PORV relief line temperature, and pressurizer relief tank [TK] level, pressure and temperature. These indications are available to the operators directly on the reactor turbine gauge board (RTGB) [MCBD] as well as the plant computer - Emergency Response Facility Information System (ERFIS) [ID], making them available to trend should this be required following an event. Annunciators [ANN] are also available to alert the control room to changes in the position of the pressurizer PORVs.

ADDITIONAL INFORMATION

A search for previous similar events at HBRSEP2, was conducted within the past three years. Although there have been instances of errors in various calculations, none were related to equipment qualification/qualified life calculations.

Energy Industry Identification System (EIIIS) codes for systems and components relevant to this event are identified in the text of this document within brackets [].